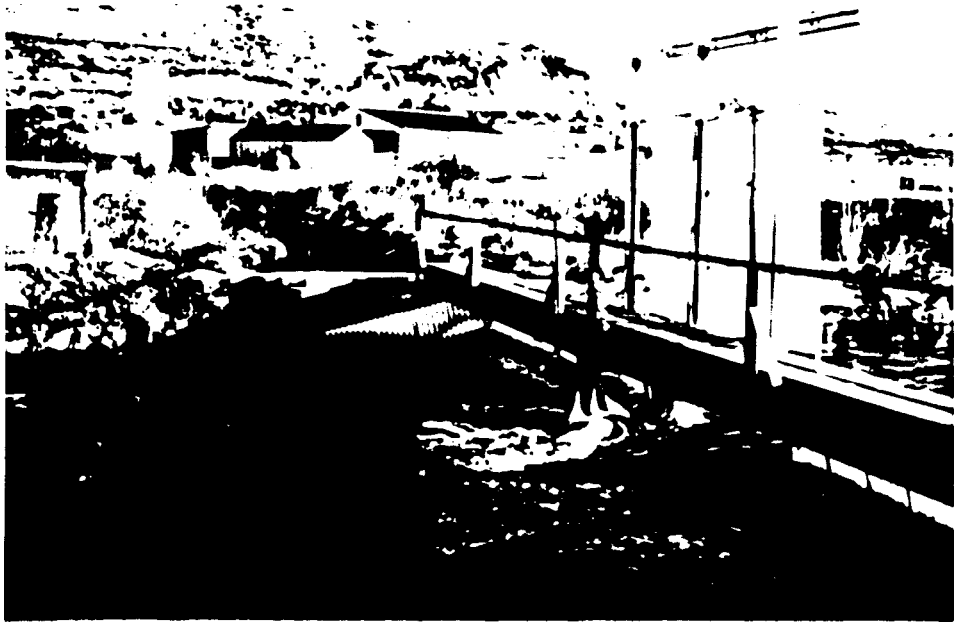
PAHSIMEROI FISH HATCHERY

1989 Brood Year Report

Summer Chinook



by

Bob Moore, Fish Hatchery Superintendent III

Julie Rensel, Fish Hatchery Superintendent I

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ABSTRACT

Chinook salmon Oncorhynchus tshawytscha trapping began on May 26 and concluded on September 25, 1989. A total of 347 summer chinook salmon (118 males, 94 females and 135 jacks) and 73 spring chinook salmon (28 males and 45 females) were trapped during 1989. The summer chinook salmon were injected, and their prespawning mortality was 1.4% due to Bacterial Kidney Disease (BKD) in three fish and gill fungus in two other fish. All spring chinook salmon were hauled for tribal fishery and were not injected with erythromycin phosphate. No mortalities were sustained this year in the spring chinook salmon.

A total of 66 summer chinook salmon females were spawned for 294,893 green eggs. Fecundity averaged 4,468 eggs and an eye-up of 96.4% was achieved.

The adult spring chinook salmon were stocked during June and July for a Shoshone-Bannock tribal fishery. Lemhi River received 35 fish, and 38 were planted in the Yankee Fork.

The smolts were released during March of 1991. Fish totaling 227,500 were stocked from pond one this year. This was 14,677 lb @ 15.5/lb with a total conversion of 1.85.

Authors:

Robert Moore
Fish Hatchery Superintendent II

Julia Rensel
Fish Hatchery Superintendent I

INTRODUCTION

Pahsimeroi Fish Hatchery is owned and funded by Idaho Power Company (IPC) and is operated by the Idaho Department of Fish and Game. The salmon and steelhead programs are mitigation for the IPC dams constructed on the Snake River in Hells Canyon. The hatchery is located near *Ellis*, Idaho; one mile upstream on the Pahsimeroi River, with the final chinook salmon rearing ponds located at a separate facility seven miles upstream on the Pahsimeroi River.

OBJECTIVES

The objectives of the Pahsimeroi Fish Hatchery are as follows:

1. To rear one million summer chinook salmon smolts for release into the Pahsimeroi River.

2. To trap and spawn summer chinook salmon adults returning to the Pahsimeroi River.

WATER SUPPLY

Water for the hatchery is supplied by the Pahsimeroi River, and varies in temperature from 32°F during the winter to 67°F in summer. The river water has a high organic load during winter but is quite clean during the summer months. In addition, the hatchery has spring water available for its egg incubation system. Its temperature varies from 52°F in the winter to 55°F in the summer, and has a pH of 7.8.

HATCHERY FACILITIES

Located on the hatchery is a fish trap constructed of three concrete pens measuring 15 ft x 75 ft x 4.5 ft deep. Adult fish are held in these pens until they are spawned. A 55 ft long weir crosses the Pahsimeroi River to guide the arriving fish into the trap facility. The trap has a series of ladders in the structure and a metal grate that keeps the fish from *returning* to the river.

Near the trap facility is a residence, two pump houses, a 10,000 gallon water storage tank, a metal shop building, a cinder block office building, a public restroom, an incubator room with capacity for 20 double stacks of Heath incubators, and a building with a two-bedroom dormitory and workshop. Four concrete raceways (4 ft x 100 ft) are used for early rearing of salmon and steelhead Oncorhynchus mykiss fry.

Two dirt rearing ponds (40 ft x 300 ft) are located seven miles above the trap at **a** separate facility. These are used to rear summer chinook salmon smolts. Facilities at the upper site include a residence, a small storage

building, a feed bin for storing dry fish feed, and **a** walk-in freezer for storing frozen salmon feed.

SUMMER CHINOOK SALMON TRAPPING

Trapping for summer chinook salmon started on June 23 and ended on September 25. The run consisted of 212 adults and 135 jacks, for a total of 347 fish. Length frequencies were taken on all adults (Figure 1).

Age class breakdown for males was as follows: ≤ 64 cm. for jacks, >64 and ≤ 85 cm. for four-year olds, and >85 cm. for five-year olds. Females ≤ 83 cm. were four-year olds, and >83 were five-year olds (Table 1). The summer chinook salmon run was made up of 181 four-year olds and 31 five-year olds (Figure 2). All fish held were injected with erythromycin phosphate to reduce mortality from BKD. In addition, the females were treated three times a week with 166.7 ppm formalin. The water flow in the female pen was reduced to 4 cfs, and 18 gallons of formalin were metered out over **a** one-hour period.

Pre-spawning mortality amounted to three females and two males, or 1.4% of the run. Mortalities appeared to be from BKD and two from gill fungus. A total of 25 adult males, 24 females and 33 jacks were released above the weir to spawn naturally in the Pahsimeroi River.

SUMMER CHINOOK SALMON SPAWNING INFORMATION

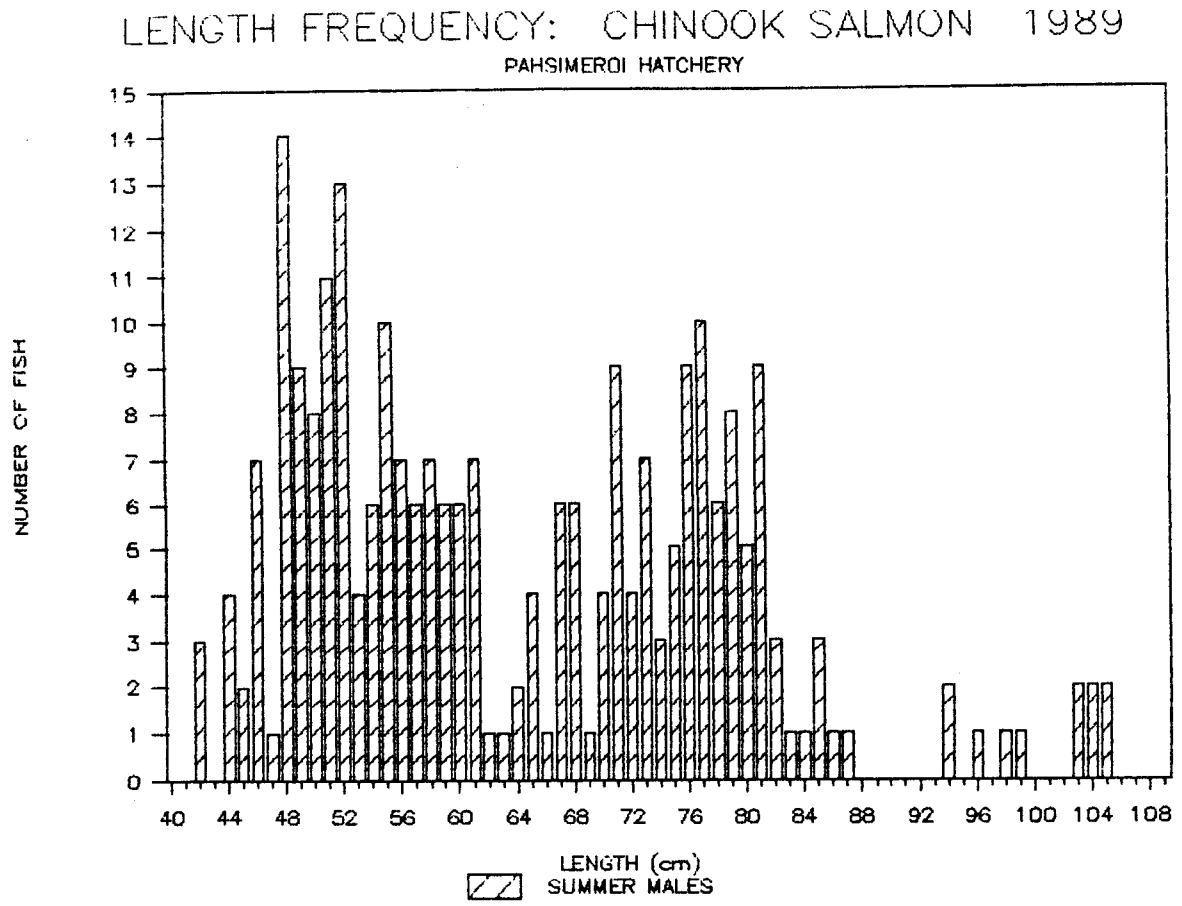
Summer chinook salmon spawning began on August 25 and concluded on September 22. A total of 66 females were spawned for 294,893 green eggs. Fecundity averaged 4,468 eggs per female, and the average eye-up was 96.4%.

SPRING CHINOOK SALMON TRAPPING

Spring chinook salmon trapping began on May 26 and concluded on June 22 (Figure 3). The run consisted of 28 males and 45 females. Length frequencies were taken on all adult fish (Figure 4). Age class breakdown was determined by lengths (Table 1). Both males and females measuring 83 cm and less were classified as four year olds, and anything greater than 83 cm were five year olds. Four year olds amounted to 24 fish, while five year olds amounted to 49 fish (Figure 2). All of these spring fish were hauled to the Indians for a tribal fishery and therefore were not injected with erythromycin phosphate. There was no hauling mortality sustained this year.

SALMON RELEASES FOR TRIBAL FISHERY

A total of 35 adult spring chinook salmon were planted in the Lemhi River in June, and 45 adults were released into the Yankee Fork in July. Members of



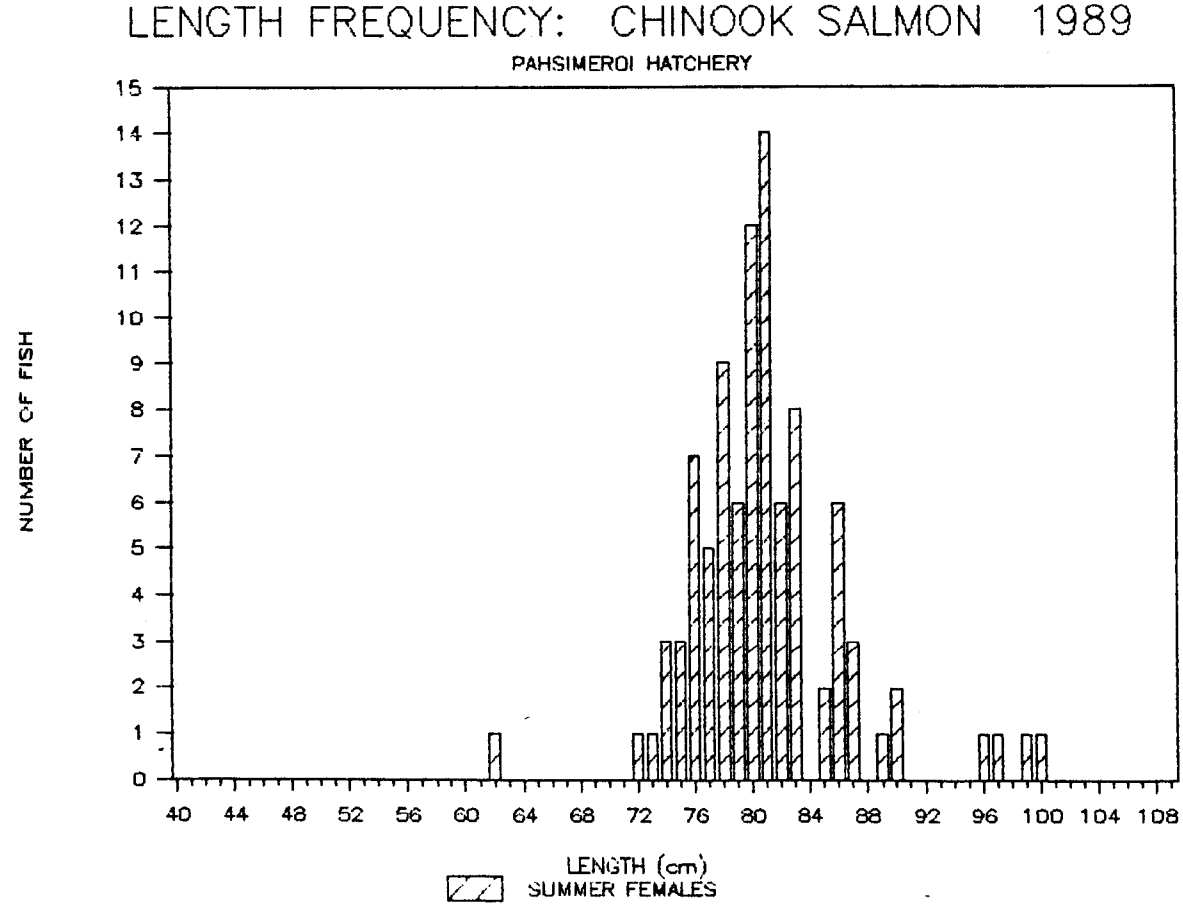


Figure 1. Length frequency distribution - summer chinook, 1989.

Table 1. Chinook Salmon Length Frequency 1989

(cms)	Summer males	Summer females	Spring males	Spring females	(in.)	*	(cms)	Summer Tacks	(in.)
62		1			24.4	*	40		15.7
63					24.8	*	41		16.1
64					25.1	*	42	3	16.5
65	4				25.5	*	43		16.9
66	1				25.9	*	44	4	17.3
67	6				26.3	*	45	2	17.7
68	6		1		26.7	*	46	7	18.1
69	1		1		27.1	*	47	1	18.5
70	4		1		27.5	*	48	14	18.9
71	9			1	27.9	*	49	9	19.3
72	4	1			28.3	*	50	8	19.7
73	7	1	2		28.7	*	51	11	20.1
74	3	3	1		29.1	*	52	13	20.5
75	5	3		1	29.5	*	53	4	20.9
76	9	7		2	29.9	*	54	6	21.3
77	10	5		1	30.3	*	55	10	21.7
78	6	9			30.7	*	56	7	22.0
79	8	6	1	1	31.1	*	57	6	22.4
80	5	12	1	2	31.4	*	58	7	22.8
81	9	14		1	31.8	*	59	6	23.2
82	3	6	1	1	32.2	*	60	6	23.6
83	1	8	1	4	32.6	*	61	7	24.0
84	1			4	33.0	*	62	1	24.4
85	3	2	2	6	33.4	*	63	1	24.8
86	1	6	2	3	33.8	*	64	2	25.2
87	1	3	2	5	34.2	*			
88			4	2	34.6	*		135	
89		1	1	2	35.0	*			
90		2		2	35.4	*			
91			2	3	35.8	*			
92				1	36.2	*			
93			2	1	36.6	*			
94	2		3	1	37.0	*			
95				1	37.4	*			
96	1	1			37.7	*			
97		1			38.1	*			
98	1				38.5	*			
99	1	1			38.9	*			
100		1			39.3	*			
101					39.7	*			
102					40.1	*			
103	2				40.5	*			
104	2				40.9	*			
105	2				41.3	*			
106					41.7	*			
107					42.1	*			
108					42.5	*			
109					42.9	*			
TOTAL	118	94	28	45					

	Summer	Springs
3 YR. M	135	
4 YR. M	105	10
4 YR. F	76	14
5 YR. M	13	18
5 YR. F	18	31
Total adults	212	73

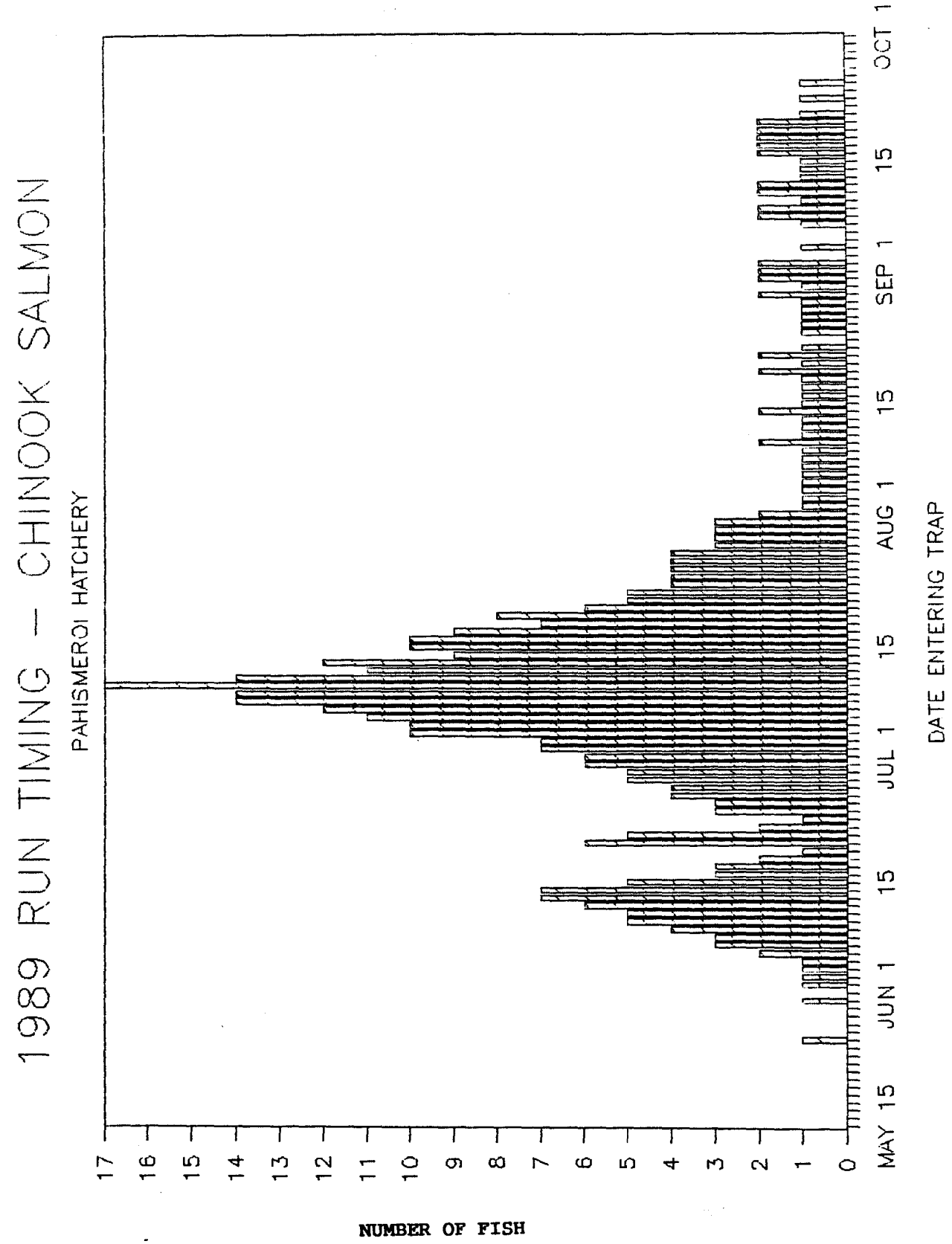
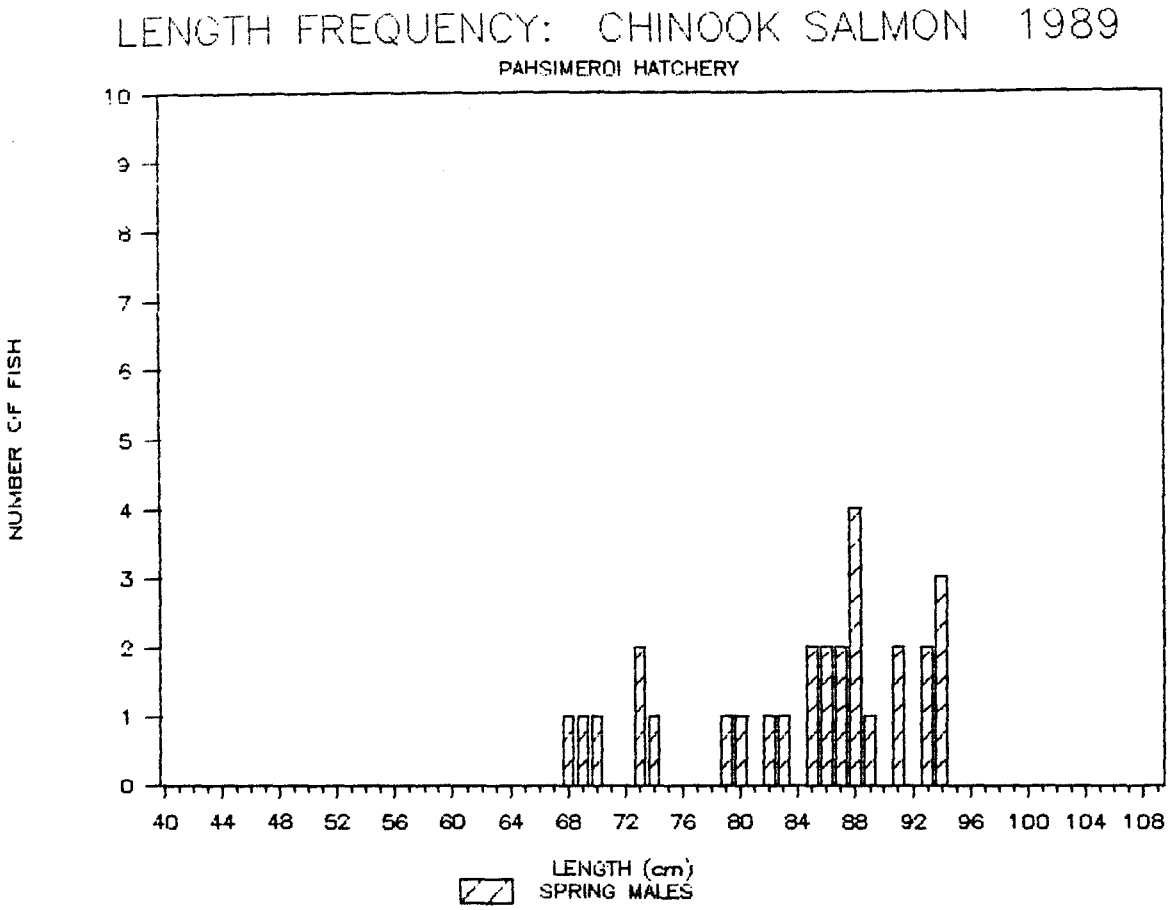


Figure 2. Run timing of all chinook salmon returning to Pahsimeroi Fish Hatchery, 1989.



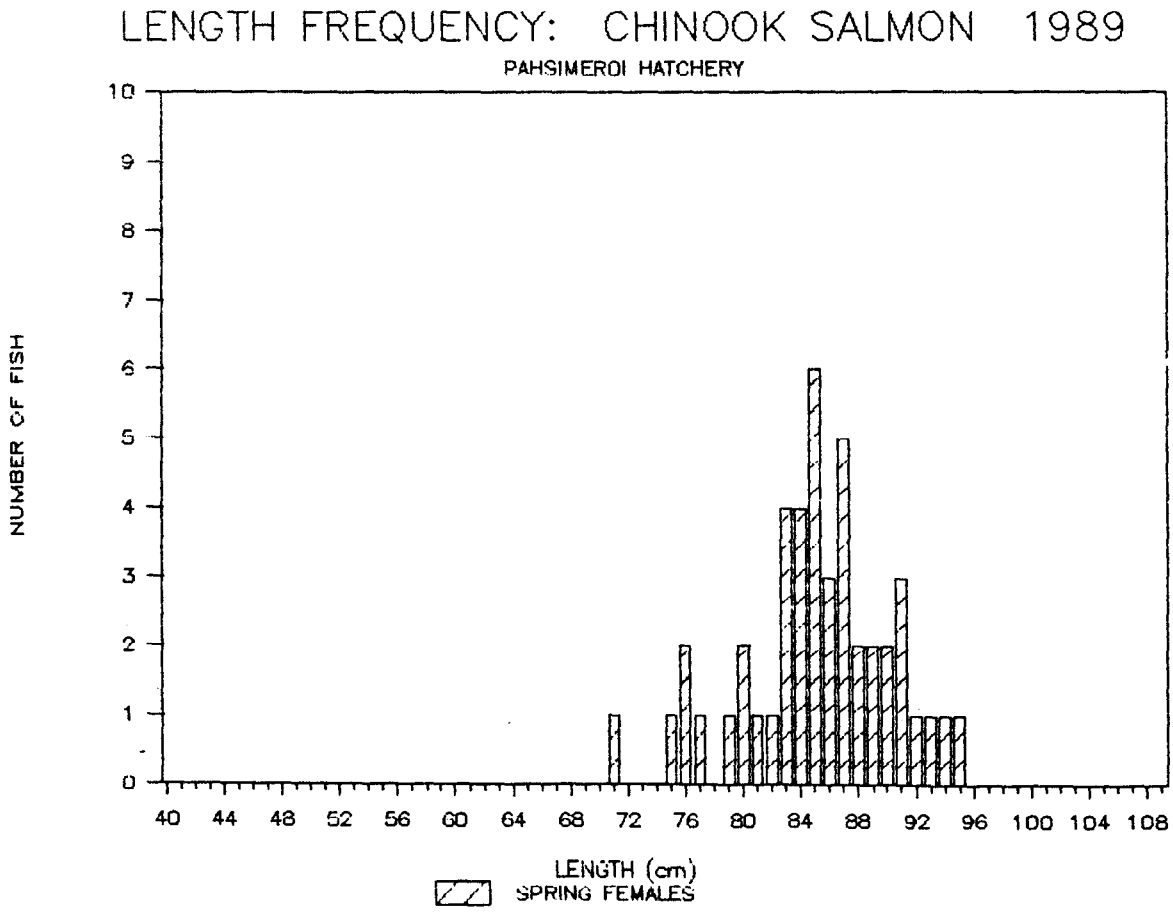
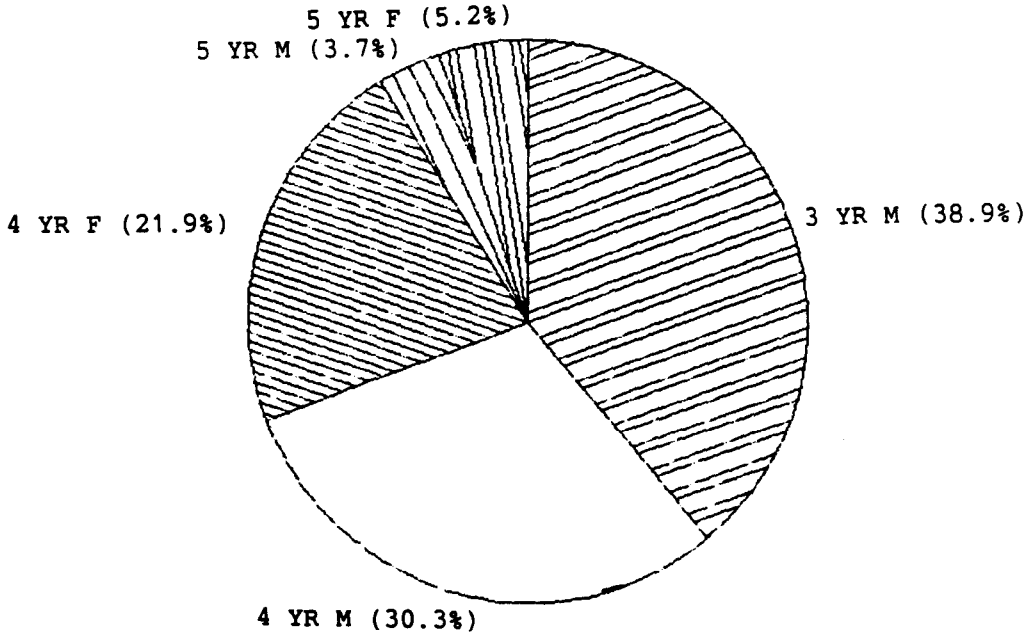


Figure 3. Length frequency distribution - spring chinook, 1989.

AGE CLASS OF SUMMER CHINOOK[1] 1989



AGE CLASS OF SPRING CHINOOK[1] 1989

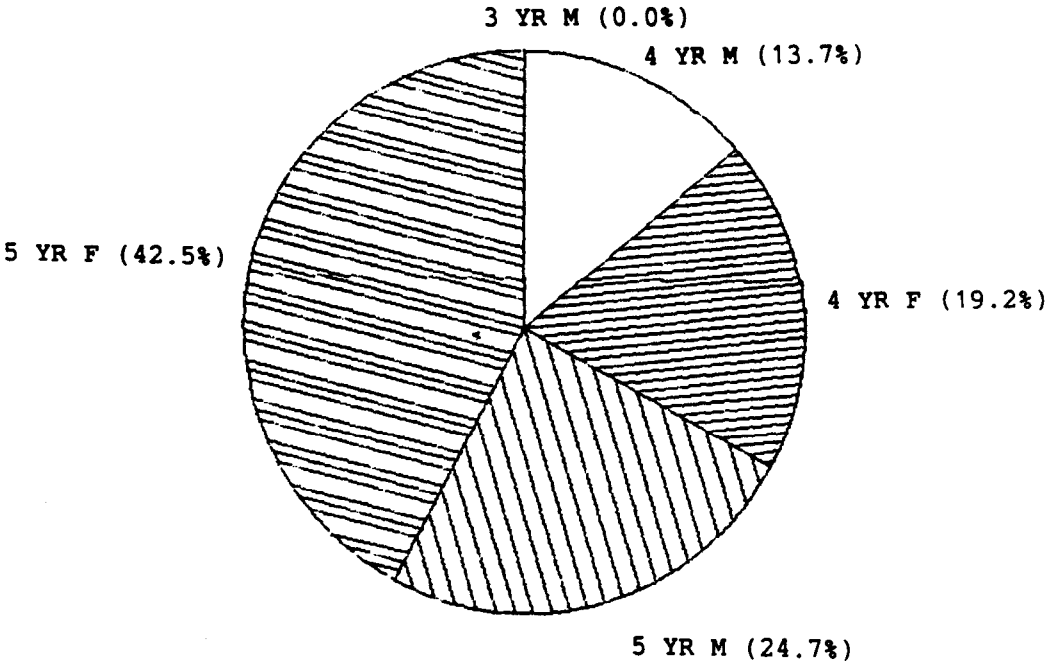


Figure 4: Age class distribution - spring and summer chinook.
[1]Age class determined by length frequency criteria found under "Spring and Summer Trapping."

the Shoshone-Bannock Indian Tribes then conducted a traditional-style fishery in these areas.

CARCASS DISPOSITION

Ponded fish were injected with erythromycin and treated externally with formalin because of the warm, low water this summer. Since the fish were treated, the carcasses had to be hauled to the landfill to be buried.

SPAWNING TECHNIQUE

Females were sorted twice a week for ripeness. Ripe fish were killed by a blow to the head, and bled by severing the caudal artery. Salmon were spawned at a ratio of one female:one male. The eggs were hand stirred and allowed to sit for five minutes. The eggs were then loaded into the incubator trays with one female per tray. Each tray, containing **a** 100-ppm iodine solution (Argentyne), was then allowed to sit for one-half hour before being put back into the water flow of the incubator stack.

Until the eggs eyed-up, they were treated daily with a 15 minute, 16 oz drip (1,667 ppm) of formalin to help reduce fungus build-up. After eye-up, the eggs were shocked and then the dead eggs were picked and counted using the displacement method. The dead egg numbers were taken from the initial green egg numbers to get the percent eye-up. After the eggs were eyed and picked, the incubator system was switched from spring water to the cooler river water to retard fry development.

FISH PRODUCTION

Transfer of salmon fry into the raceways began during mid-November, and continued through January. Initially, these fish were hand fed at a rate of 3% of body weight. A feed study between BioDiet and Oregon Moist pellets was conducted on the fry while the were held in the raceways. Fish were ponded in mid-May this year due to the construction work on the intake canal in April. Pond one received 232,786 fish. Pond two remained empty. All fish were fed Oregon Moist pellets after ponding. The total conversion this year was 1.85. A total of 227,500 fish (14,677 lbs @ 15.5/lb.) were released during the week of March 13-22, 1991 (Table 2).

FEED STUDY

The study was conducted from January 4, 1990 through March 15, 1990. The study started after all lots of fish were transferred into the raceways. The earlier lots were put into raceway one, and the last lots were put in raceway two. They were pound counted before the start of the study on days 15 and 30 of each month. A feed schedule was calculated, and raceway one received OMP feed

and raceway two was fed BioDiet, each at a rate of 3% of body weight. The feed schedule was adjusted after each pound count to maintain the 3% rate. At the end of the study, the conversion for raceway one had been 1.99, and raceway two was 1.67 in comparison. Both raceways were put on BioDiet for a three-week Gallimycin treatment, and then were fed a 50:50 mix of OMP and BioDiet for the remaining time in the raceways. At ponding, the fish in raceway two were still in better condition than raceway one.

FISH HEALTH

Whirling disease was again diagnosed in these fish. Blacktails, the first sign of the disease, appeared in early May, with the whirling appearing shortly thereafter. Whirling was most evident when the fish were "spooked," such as walking out on the feeder ramps.

A sample group of fish were held in the raceways after the majority were ponded to tell the effects of living in a cement raceway compared to the mud/gravel bottomed ponds. Signs of the disease were spotted in the raceways at the same time as in the ponds, thus indicating there is enough of the pathogen present in the river water itself for the fish to contract the disease.

HATCHERY IMPROVEMENTS

Many new improvements have been made at the hatchery this year. The office was carpeted; baseboard heating and an air conditioner were installed. Cupboards were constructed for the incubator room and upper residence. A new washer and dryer, refrigerator, microwave, and a color television set were purchased for the dormitory.

Additional baffles were made and installed in the raceways. Improvements to the ponds include: the walls and floor of the intake canal were cemented; three new electric feeders were installed on pond one; conduit was run for all electrical lines to the feeders; the automatic feeder timer was repaired and the old parts replaced; and the feed shed at the ponds and the water storage tank for the incubators were painted.

Many safety improvements have been made this year. All electrical wiring on the hatchery has been brought up to safety code, grills have been placed in front of all culverts; and walkway platforms have been placed over all keyways at the ponds. A large first aid kit was installed in the shop, and an emergency eye wash station has been plumbed into the incubator room.

STAFFING

The hatchery is staffed with two permanent employees; a Hatchery Superintendent II, and a Hatchery Superintendent I. Several temporaries are employed at various times of the year to help with the spawning of steelhead and salmon.

TABLE 2. Brood Year 1989 Summer Chinook salmon Production Costs

Lb of fish produced	Lb of feed fed	Feed cost	Conversion	Cost per lb produced
14,677 (227,500 fish)	28,865	$13,205	1.85 ave.	$.8997

Feed costs	$13,205
Personnel costs	56,495
Operating costs	21,872
Program total *	91,572

Total Program cost per pound of fish produced = $ 6.24

Total Program cost per fish produced = $ .4025

* Costs estimated for an entire 18-month rearing cycle of one broodyear only.

ACKNOWLEDGEMENTS

The crew at Pahsimeroi Fish Hatchery would like to express their appreciation to all those who helped with the spawning, and transporting of steelhead and salmon. We would also like to thank Paul Abbott and the staff of Idaho Power Company for their continued help and support.

Submitted by:

Robert Moore
Hatchery Superintendent II

Julie Rensel
Hatchery Superintendent I

IDAHO DEPARTMENT OF FISH AND GAME

Steven M. Huffaker, Chief
Bureau of Fisheries

Bill Hutchinson
Hatcheries Manager